IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-14 canceled

15. (New) Method for the immobilization of mediator molecules on implant materials, characterized in that in a first step anchor molecules are covalently bound to the chemically activated surface of the implant material, wherein the anchor molecules have functional groups to which further chemical compounds can be covalently bound and in a second step mediator molecules are immobilized on the implant material via these functional groups, wherein the implant material is chosen from a material from the group of metals, metallic alloys, ceramic materials or combinations thereof.

16. (New) Method for the immobilization of mediator molecules on implant materials, characterized in that in a first step anchor molecules are covalently bound to the chemically activated surface of the implant material, wherein these anchor molecules have functional groups to which further chemical compounds can be covalently bound, and in a second step mediator molecules are immobilized on the implant material via these functional groups, wherein bone growth factors from the class of the BMP proteins, ubiquitin, antibiotics or mixtures thereof can be used as mediator molecules.

17. (New) Method according to claim 16, characterized in that the implant material is chosen from a material from the group of metals, metallic alloys, ceramic materials or combinations thereof.

18. (New) Method according to claim 15, characterized in that in an intermediate step between the first and second step spacer molecules are bound to the anchor molecules from the first step, and these spacer molecules have further functional groups for the covalent binding of further molecules, and in the second step the mediator molecules are immobilized on the implant material via the functional groups of the spacer molecules.

19. (New) Method according to claim 15, characterized in that at least a part of the chemical bonds of the mediator molecules to the surface of the implant material is modified such that the bonds can be cleaved under physiological conditions.

20. (New) Method according to claim 15, characterized in that BMP-2 or BMP-7 is used as the bone growth factor.

21. (Added) Method according to claim 15, characterized in that the surface of the implant material is provided with an oxide layer prior to the covalent binding of the anchor molecules.

22. (New) Method according to claim 21, characterized in that, prior to the binding of the anchor molecules, the surface of the implant material, chosen from titanium, titanium alloys, aluminium or stainless steel, is provided with an oxide layer by treatment with hot chromic-sulfuric acid over a time span of 0.5 up to 3 hours at 100 to 250°C.

23. (New) Method for the application of an oxide layer on metallic substrates, characterized in that the surface of the metallic substrate is treated with hot chromic-sulfuric acid over a time span of 0.5 up to 3 hours at 100 to 250°C.

24. (New) Method according to claim 23, characterized in that the chromic-sulfuric acid has a density of more than 1.40 g/cm^3.

25. (New) Method according to claim 24, characterized in that the metallic substrate concerns in implant.

26. (New) Method according to claim 15, characterized in that in a first step anchor molecules are covalently bound to the implant surface, in an intermediate step spacer molecules are covalently bound to the anchor molecules, wherein the spacer molecules reduce the nonspecific absorption of the mediator molecules, and in a second step the mediator molecules are covalently coupled to the spacer molecules.

27. (New) Method according to claim 26, characterized in that in a first step aminoalkylsilane molecules are covalently bound to the implant surface, in a second step agarose molecules are covalently bound to the anchor molecules as spacer molecules, and in a third step a bone growth factor from the class of the BMP proteins or ubiquitin is covalently coupled to the agarose as mediator molecules.

28. (New) Implant, obtainable according to the process of claim 15.

29. (New) Implant according to claim 28, characterized in that the implant material is made of titanium, titanium alloys, aluminium, stainless steel or hydroxylapatite.

30. (New) Implant, obtainable according to the process of claim 16.

31. (New) Implant according to claim 29, characterized in that the implant material is made of titanium, titanium alloys, aluminium, stainless steel or hydroxylapatite.